February 6, 2012

KOPPERS

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Mr. Minesh Patel
Illinois Environmental Protection Agency
Bureau of Air (MC 11)
1021 N. Grand Avenue East
Springfield, IL 62702

RE: Koppers Inc., Stickney Plant
ID Number: 031300AAJ
Questions Regarding the Air Construction Permit Application for the #2 Tube Heater Reconstruction

Dear Mr. Patel:

This letter is in response to questions posed by you and Mr. Wei Han during your review of the #2 Tube Heater Reconstruction air construction permit application. This new heater will serve the existing #2 still (TPDS2) in the tar distillation process and will be called the #2 Tube Heater (F201).

The questions identified in the email to Koppers on January 20, 2012 are addressed below:

1. Data for the actual flow rate of "process gas" from the No. 2 Tar Still to the existing heater.

   Koppers Response: The volumetric flow rate of process waste gas to the reconstructed #2 process heater will be the same as the flow rate to the existing #2 process heater. In 1985 the volumetric flow rate on the existing #2 process heater was 595 scfm including water vapor. The composition of this waste gas is shown in the column, "% by vol. wet" in the attached spreadsheet titled "#2 Tubeheater Waste Gas Composition and Heat of Combustion".

2. Data for the actual sulfur content of this process gas.

   Koppers Response: The sulfur containing compounds in the waste gas have been identified as carbonyl sulfide 0.270%; hydrogen sulfide 0.157%; and carbon disulfide 0.199%. These percentages are volumetric, wet basis.

3. Data for the heat content of this process gas.

   Koppers Response: Using individual heat of combustion values for the combustible components in the waste gas, the hourly heat release is 4.3 million BTUs or 119 BTU/scf. The combined burner capacity for the natural gas (14 MMBtu/hr) and the waste gas from the #2 still (4.3 MMBtu/hr) is 18.3 MMBtu/hr. The Tube Heater has process controls that maintain the fuel burning of the two gases to meet the heating demands of the still, so under typical operations, natural gas firing is reduced by a corresponding amount provided by the process gas.

4. Detailed supporting calculations for the actual SO2 emissions of the No. Tar Still during the baseline time period.

Koppers Response: Derivation of the SO2 emissions is provided in the attachment titled "#2 Tubeheater Waste Gas Composition and Heat of Combustion". Assuming total conversion of the sulfur component of the sulfur containing compounds, the emission rate is 40.29 lbs/hr of sulfur dioxide.

An SO2 emission rate of 41.4 lbs/hr from the stills through the tube heaters was reported by Koppers as the basis of the SO2 emission calculations in this Air Construction Permit Application. The rate of 41.4 lbs/hr is conservative and slightly overstates SO2 emissions in comparison to the derived rate of 40.29 lbs/hr.

5. A simple diagram of the tube heater describing its layout, including burner(s),* combustion chamber and convection section, where tar is heated.

* In particular, are natural gas and process gas "pre-mixed" before being introduced to the burner, or is process gas separately introduced into the heater? If the latter, the location at which process gas enters the tube heater needs to be shown on the diagram.

Koppers Response: Drawing ACH-0336 is an elevation view of the reconstructed #2 Tube Heater showing the locations of the burner, the combustion chamber, and the convection section. Drawing BCH-0069 shows the burner configuration and the locations of the natural gas and waste gas nozzles.

During a telephone conference call with IEPA on 01/23/2012, some confusion occurred regarding what process and other gases may be burned in this tube heater. Koppers has determined that the process diagram in the application did not clearly depict that only process gases from the #2 still can be burned in the reconstructed #2 Tube Heater. Corrections to the process diagram are included as an attachment to this letter.

6. A discussion supporting classification of the "Naphthalene Heater" as an existing emission unit. In particular, this heater is not currently permitted to operate by the CAAPP permit for the source and has been out of service for almost 20 years.

Koppers Response: We understand that this tube heater will be treated as a new emission unit for purposes of this construction permit. As provided in the cover letter and Attachment A to the application, the #5 Tube Heater was an existing natural gas-fired combustion device at this location and was originally permitted with the IEPA as the "Naphthalene Heater F001"in 1979. The #5 tube heater was put out of service and mothballed in the late 1980's. At the time of the application for the initial Clean Air Act Permit Program (CAAPP) permit in the early 1990's, Koppers chose to keep the #5 tube heater out of service and did not include the heater in the original CAAPP permit application. The foundation and casing of the #5 tube heater will be used in the reconstructed #2 Tube Heater.

7. A discussion whether the reconstructed (new) heater should be considered a fuel combustion emission unit or a control device for the Tar Still, or both, with justification.

Koppers Response: As described in item 5 above, the reconstucted #2 Tube Heater will typically burn both natural gas and process gases from the still in an identical way that the existing #2 Tube Heater is currently fired with these gases today. The existing #2 Tube Heater serves as a control device for destruction of hazardous air pollutants (HAPs) as provided in 40 CFR 63 Subpart FFFF and also converts hydrogen sulfide (H2S) from the #2 still to SO_2 at a rate described in item 4 above. Koppers understands that the applicable SO2 emission rate from the process has been IAC 214.301 which limits emission of sulfur dioxide into the atmosphere from any process emission source to less than or equal to 2000 ppm.

If there are any other questions with regards to this letter or attachments, please do not hesitate to contact Stephanie Flynn, Stickney Plant Environmental Manager at 708-222-3481.

Sincerely,

Richard W. Wagner
Plant Manager

Attachments: #2 Tubeheater Waste Gas Composition and Heat of Combustion, 1-30-2012

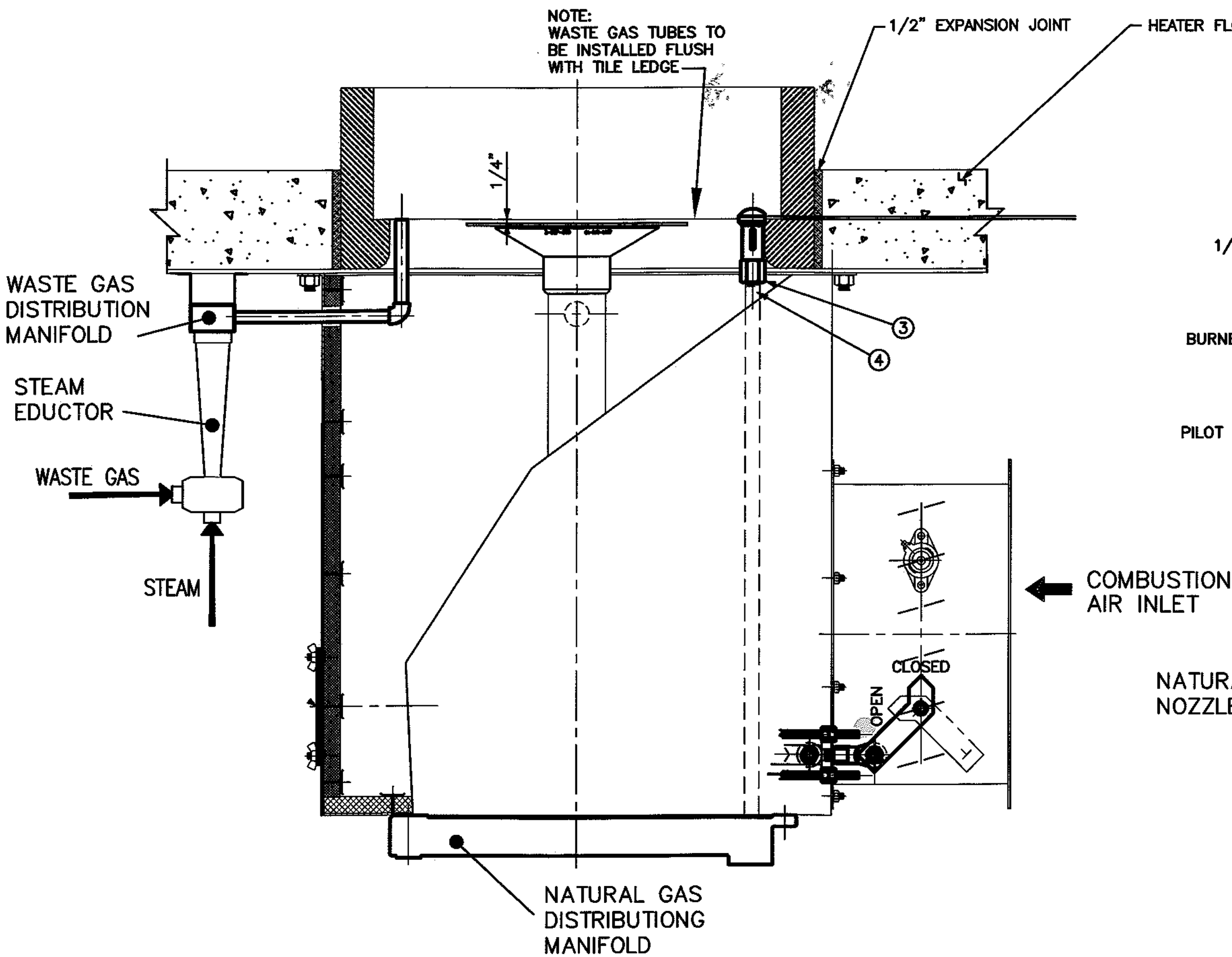
Drawing ACH-0336, New No. 2 Tube Heater (F201), 1-26-11

Drawing BCH-0069, Burner Detail Natural/Waste Gas Tar Reboiler, 1-26-2012

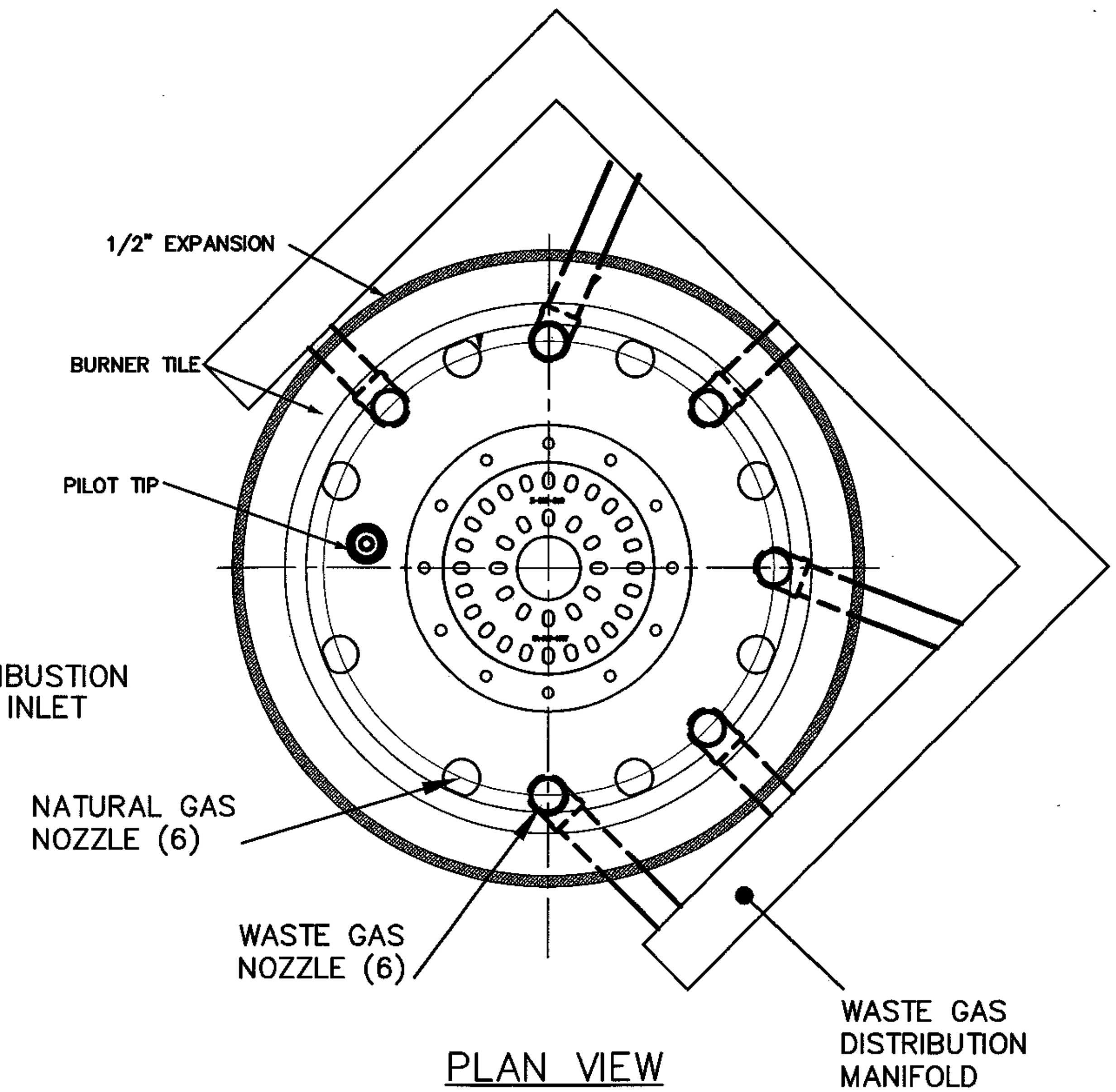
Drawing BCH-0067 r. 2, (Revised Process Diagram), 1-24-2012

cc: Bernard Evans, P.E.; ERM, Inc.
John Irvine, Koppers Pittsburgh

BCH-0069



SECTIONAL ELEVATION



PLAN VIEW

REV.	DESCRIPTION	CHECKED	DATE	NAME	DATE
0	PERMIT REVIEW		1/26/12	DRAWN BY: J.E. BAYLIE	01/26/12
				CHECKED BY: J.L.	
				APPROVED BY:	

KOPPERS
Pittsburgh, Pennsylvania 15219

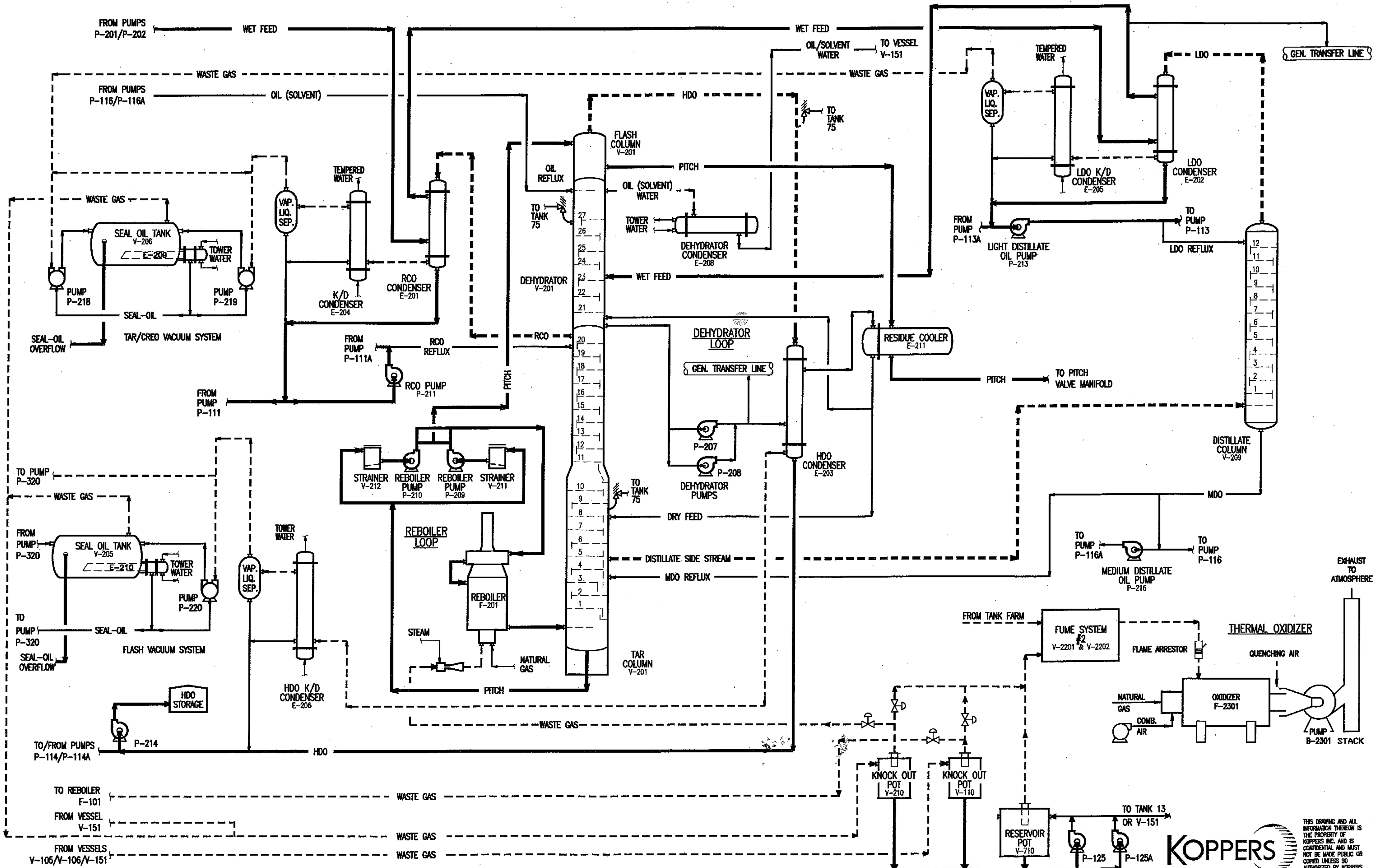
TAR DIST

BURNER DETAIL
NATURAL/WASTE GAS
TAR REBOILER

B.M. NO. PROJECT

BCH-0069

0
REV.



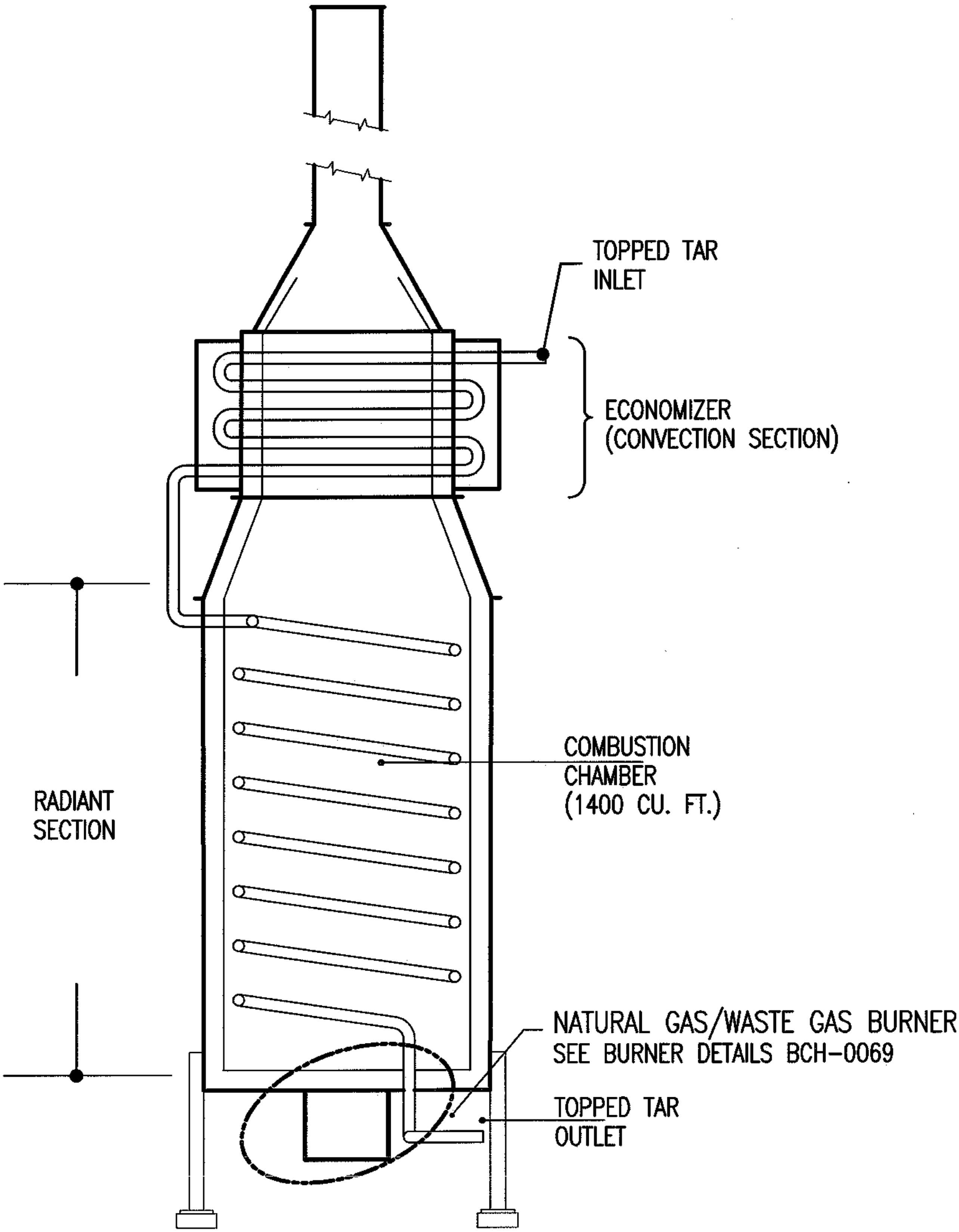
KOPPERS

Pittsburgh, Pennsylvania 15219

DWG. NO. BCH-0067 REV 2 01-24-12

KOPPERS
Pittsburgh, PA 15219

TITLE NEW No. 2 TUBE HEATER (F201)					
PLANT STICKNEY	SECTION TAR	APP.		PROJ.	
DRAWN J.E. BAYLIE	DATE 1/26/12	DWG. ACH-0336	REV. 0	DATE 1/26/12	
CHECKED J.L.	DATE 1/26/12	SCALE: NONE		PAGE 1 OF 1	



Jan 30, 2012

#2 Tubeheater Waste Gas Composition and Heat of Combustion

Waste gas flow rate, scfm (wet)*	595
Stack Gas Temp, F	800
Eductor Steam Flow, pph	970
Excess Oxygen (for waste gas) %	30

Component	Formula	Mol Wt	% by vol. wet *	Stoic. Oxygen Reqd mole O2 /mole HC	Stoic. Oxygen Reqd # O2/# HC	Stoic. H2O Prod mole H2O /mole HC	Stoic. H2O Prod #H2O/# HC	Waste Gas lbs./100 scf	Waste Gas lbs./hr	Stoic. O2 Req'd lbs O2/hr	H2O Prod lbs H2O/hr	SO2 Prod lbs SO2/hr	Ht of comb BTU/lb	Gross Ht Release BTU/hr
Benzene	C6H6	78	0.40	7.50	3.08	3.00	0.69	0.09	31.03	95.47	21.48	0.00	17,480	542,338
Toluene	C7H8	92	0.30	9.00	3.13	4.00	0.78	0.08	27.45	85.92	21.48	0.00	17,620	483,603
Xylene	C8H10	106	0.30	10.50	3.17	5.00	0.85	0.09	31.62	100.24	26.85	0.00	17,760	561,622
Styrene	C8H8	104	0.10	10.00	3.08	4.00	0.69	0.03	10.34	31.82	7.16	0.00	17,407	180,024
Indan	C9H10	118	0.10	11.50	3.12	5.00	0.76	0.03	11.73	36.59	8.95	0.00	17,386	204,012
Indene	C9H8	116	0.10	11.00	3.03	4.00	0.62	0.03	11.54	35.00	7.16	0.00	17,158	197,924
Naphthalene	C10H8	128	0.10	12.00	3.00	4.00	0.56	0.04	12.73	38.19	7.16	0.00	16,708	212,671
Carbonyl sulfide	COS	60	0.270	1.50	0.80	0.00	0.00	0.05	16.11	12.89	0.00	17.18	3,933	63,360
Hydrogen Sulfide	H2S	34	0.103	1.50	1.41	1.00	0.53	0.01	3.48	4.92	1.84	6.56	6,545	22,793
Carbon Disulfide	CS2	76	0.130	3.00	1.26	0.00	0.00	0.03	9.82	12.41	0.00	16.55	5,814	57,122
Oxygen	O2	32	10.30	0.00	0.00	0.00	0.00	0.92	327.76	0.00	0.00	0.00	0	0
Nitrogen	N2	28	45.40	0.00	0.00	0.00	0.00	3.54	1,264.12	0.00	0.00	0.00	0	0
Hydrogen	H2	2	1.30	0.50	8.00	1.00	9.00	0.01	2.59	20.68	23.27	0.00	51,623	133,472
Methane	CH4	16	3.96	2.00	4.00	2.00	2.25	0.18	63.01	252.03	141.77	0.00	21,520	1,355,911
Carbon Monoxide	CO	28	0.50	0.50	0.57	0.00	0.00	0.04	13.92	7.96	0.00	0.00	4,347	60,519
Carbon Dioxide	CO2	44	0.50	0.00	0.00	0.00	0.00	0.06	21.88	0.00	0.00	0.00	0	0
Ethylene	C2H4	28	0.20	3.00	3.43	2.00	1.29	0.02	5.57	19.09	7.16	0.00	20,295	113,019
Ethane	C2H6	30	1.00	3.50	3.73	3.00	1.80	0.08	29.83	111.38	53.70	0.00	20,432	609,545
Water	H2O	18	34.80					1.74	622.91	0.00	622.91	0.00	0	0
Total	Total		100					7.05	2,517.44	864.58	950.89	40.29		4,255,596

Inlet		Tube Heater #2	Outlet	
Waste Gas	2,517 pph		4,979 pph	Stack Gas (non-condensables)
Comb Air	3,447 pph		1,955 pph	Stack Water Vapor
Eductor Steam	970 pph			

Base line Temp = 100F (average temperature of waste gas and combustion air)

251,715	Heat absorbed by eductor steam (BTU/hr) = 0.5 * (Stack Temp, F - 281F) * mass flow rate, pph
344,874	Heat absorbed by non-eductor water vapor (BTU/hr) = (Stack Water Vapor - Eductor Steam) * (Stack Temp - 100) * 0.5
871,290	Heat absorbed by other combustion gasses (BTU/hr) = Stack Gas * (Stack Temp - 100) * 0.25
2,787,718	Heat recovery from waste gas combustion, BTU/hr

* Based on "CHICAGO WASTE GAS ANALYSIS SUMMARY", 5/22/1985